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(71) 【出願人】

【識別番号】 000003148

【氏名又は名称】 東洋ゴム工業株式会社

【住所又は居所】 大阪府大阪市西区江戸堀1丁目17番18号

(72) 【発明者】

【氏名】 中野 佐知子

【住所又は居所】 兵庫県加古郡稲美町六分一字内ケ池1176 東洋ゴム工業株式会社兵庫事業所内

(72) 【発明者】

【氏名】 塚本 千秋

【住所又は居所】 兵庫県加古郡稲美町六分一字内ケ池1176 東洋ゴム工業株式会社兵庫事業所内

(72) 【発明者】

【氏名】 鈴木 孝

【住所又は居所】 兵庫県加古郡稲美町六分一字内ケ池1176 東洋ゴム工業株式会社兵庫事業所内

(72) 【発明者】

【氏名】 八木 晃

【住所又は居所】 兵庫県加古郡稲美町六分一字内ケ池1176 東洋ゴム工業株式会社兵庫事業所内

(74) 【代理人】

【弁理士】

【氏名又は名称】 宮本 泰一

【目的】 スポーツ用衣料、紙おむつ、サニタリー及びメデイカル関連分野等において用いられる積層シートの接着性、伸縮性及びその風合い等を改良する。

【構成】 熱可塑性ウレタン樹脂をフィルム状に押出し、このフィルムが未だ熔融状態にある間に、一方ポリオレフィン系繊維製不織布の少なくとも片面側に適宜コロナ放電処理を行い、その処理面を前記フィルム側にして押えロール、例えばエンボスロールで両者を積層・圧着せしめた積層シート及びその製造方法。

(71) [Applicant]

[Applicant Code] 000003148

[Name] Toyo Tire & Rubber Co., Ltd.

[Address] Osaka Prefecture Osaka City Nishi-ku, Edobori 1 Chome 17-18 number

(72) [Inventor]

[Name] Nakano Sachiko

[Address] The inside of Hyogo Prefecture Kako-gun Inami-cho Rokubuichi Aza Uchinoike 1176 Toyo Tire & Rubber Co., Ltd. Hyogo business place

(72) [Inventor]

[Name] Tsukamoto Chiaki

[Address] The inside of Hyogo Prefecture Kako-gun Inami-cho Rokubuichi Aza Uchinoike 1176 Toyo Tire & Rubber Co., Ltd. Hyogo business place

(72) [Inventor]

[Name] Suzuki Takashi

[Address] The inside of Hyogo Prefecture Kako-gun Inami-cho Rokubuichi Aza Uchinoike 1176 Toyo Tire & Rubber Co., Ltd. Hyogo business place

(72) [Inventor]

[Name] Yagi Akira

[Address] The inside of Hyogo Prefecture Kako-gun Inami-cho Rokubuichi Aza Uchinoike 1176 Toyo Tire & Rubber Co., Ltd. Hyogo business place

(74) [Attorney(s) Representing All Applicants]

[Patent Attorney]

[Name] Miyamoto Yasukazu

[Objective] The adhesiveness of the laminated sheet which is used the clothing for the sports, in the paper diaper, the sanitary and the medical related field etc, the stretchability and its texture etc are improved.

[Constitution] The thermoplasticity urethane resin the extrusion is done in the film, with the roll for example embossing roll the lamination・pressure bonding obtains the both the laminated sheet and its production method where this film does the as needed corona

【請求項1】 熱可塑性ウレタン樹脂フィルムと、ポリオレフィン系繊維よりなり前記フィルムとの積層面に対し予めコロナ放電処理を施した不織布を積層・圧着してなることを特徴とする積層シート。

【請求項2】 熱可塑性ウレタン樹脂フィルムの厚みが5～100 μ mであることを特徴とする請求項1記載の積層シート。

【請求項3】 熱可塑性ウレタン樹脂をフィルム状に押出し、該フィルムが未だ熔融状態にある間に、少なくとも片面にコロナ放電処理を施したポリオレフィン系繊維よりなる不織布をその処理面をフィルム側にして積層・圧着せしめることを特徴とする積層シートの製造方法。

【請求項4】 前記コロナ放電処理の強度を部分的に変化させて処理を施すことを特徴とする請求項3記載の積層シートの製造方法。

【請求項5】 前記熱可塑性ウレタン樹脂フィルムとポリオレフィン系繊維よりなる不織布とを積層・圧着せしめるにあたり、エンボスロールにより押・圧着せしめることを特徴とする請求項3又は4記載の積層シートの製造方法。

【0001】

【産業上の利用分野】 本発明は、主としてスポーツ用衣料、紙おむつ、サニタリー及びメデイカル関連分野において用いられる熱可塑性ウレタン樹脂フィルムと不織布との積層よりなる特に風合いに優れた積層シートならびその製造方法に関するものである。

discharge treatment still while being in the molten state, the one polyolefin fiber make nonwoven fabric at least on one surface side, holds down the treated surface on aforementioned film side and.

[Claim 1] The lamination・pressure bonding doing the nonwoven fabric which beforehand administers the corona discharge treatment the thermoplasticity urethane resin film and consists of the polyolefin fiber and the aforementioned film vis-a-vis the lamination plane, the laminated sheet which designates that it becomes as feature.

[Claim 2] The Claim 1 which designates that the thickness of the thermoplasticity urethane resin film is the 5 to 100 μ m as feature the laminated sheet which is stated.

[Claim 3] The thermoplasticity urethane resin the extrusion is done in the film, the nonwoven fabric which consists of the polyolefin fiber where the said film still while being the molten state, at least administers the corona discharge treatment to the one surface with the treated surface as film side the lamination・pressure bonding the production method of the laminated sheet which designates the thing which is done as feature.

[Claim 4] The partially changing the strength of the aforementioned corona discharge treatment, the Claim 3 which designates that it administers the process as feature the production method of the laminated sheet which is stated.

[Claim 5] When the aforementioned thermoplasticity urethane resin film and nonwoven fabric which consist of the polyolefin fiber the lamination・pressure bonding doing, with the embossing roll the pressing & the pressure bonding the Claim 3 which designate the thing which is done as feature or the 4 the production method of the laminated sheet which is stated.

[0001]

[Field of Industrial Application] As for the the present invention, mainly it is something regarding the production method of the laminated sheet line which is superior in the especially texture which consists of the lamination of the thermoplasticity urethane resin film and the nonwoven fabric which are used the clothing for the sports, in the paper diaper, the sanitary and the medical-related field.

【0002】

【従来の技術】従来、この種熱可塑性ウレタン樹脂フィルムと不織布とを接着した積層シートは、その積層に際しては接着剤等を用いる関係上、積層シートはその風合いがやや硬い状態となって感触が悪い。

【0003】即ち、この種熱可塑性ウレタン樹脂フィルムと不織布とを接着するには、溶剤系の接着剤を用いる方法、ホットメルト系接着剤を用いる方法等が広く用いられるが、これらの方法では何れも接着剤を用いるものであり、従ってウレタンフィルムを製膜する工程とこれと不織布とを貼合せる工程とが別々であること及び当然接着剤を必要とするためにコストがアップし、また接着剤の目付量、塗布状態により貼合せ品の風合い、透湿性等が阻害されることとなる。特に溶剤系接着剤を用いる場合においては十分な接着力を得るためには、接着剤が不織布に含浸する状態となって積層シートの優れた風合いや良好な伸縮性を得ることは困難であった。

【0004】また一方において、接着剤を用いずに熱可塑性ウレタン樹脂をフィルム状に熔融状態で押出すと同時に不織布を貼合せて積層させる方法としては、厚みの厚いフィルムで接着する方法もあるが、この場合不織布の繊維の隙間に樹脂が滲透していわゆるアンカー（投錨）効果による接着作用を呈するために積層シートの風合い及び伸縮性が妨げられ、特にウレタンフィルムをオレフィン系繊維の不織布表面に強固に接着させるためにはフィルムの厚みをより厚くする必要上そのアンカー効果も大きくなってそのために風合い及び伸縮性を阻害することとなって、接着効果と風合い、伸縮性との間には二律背反関係となっていた。

【0002】

[Prior Art] As for the laminated sheet which the conventional, this kind thermoplasticity urethane resin film and the nonwoven fabric the adhesion is done, on the relation which uses the adhesive etc in case of the lamination, as for the laminated sheet becoming the state where the texture is a little hard the feel is bad.

[0003] Namely, The adhesion to do this kind thermoplasticity urethane resin film and the nonwoven fabric, The adhesive of the solvent system is used the method, It can use the method etc which uses the hot melt adhesive widely but, With these method which being something which uses the adhesive to be, Therefore the step and this and the nonwoven fabric the lamination the step which the urethane film the film manufacture are done being separate and naturally the cost up does because the adhesive is needed, the texture and the water-vapour permeability etc of the lamination item mean with the inhibition to be done in addition the apparent weight of the adhesive, depending upon the painting state. Especially when the solvent system adhesive is used in, in order to obtain the sufficient adhesion strength, the adhesive becoming the state which the impregnation is done in the nonwoven fabric, it was difficult to obtain the texture and the satisfactory stretchability where the laminated sheet is superior.

[0004] In addition, not making use of the adhesive when the thermoplasticity urethane resin in the film the extrusion is done with the molten state, in the same time the lamination it does the nonwoven fabric as the method, There is also a method which the adhesion is done with the film where the thickness is thick but, In this case the resin the infiltration doing in the gap of the fiber of the nonwoven fabric, in order to display the adhesion action due to the so-called anchor (anchor) effect the texture and the stretchability of the laminated sheet to be obstructed, Especially the urethane film in order the adhesion it does firm in the nonwoven fabric surface of the olefin fiber, also the anchoring effect with respect to the necessity to make the thickness of the film thicker becoming large, coming to the point of with the inhibition doing the texture and the stretchability depending upon because of that, it had become the antinomy relation with the adhesion effect and the texture and the

【0005】

【発明が解決しようとする課題】そこで、本発明者は、上述の如き実状に鑑み、接着力を保持したまま優れた風合いと伸縮性を併有するこの種積層シートの積層接着技術について鋭意検討を続けたところ、接着剤を用いることなく単に不織布側の接合面をコロナ放電処理を施すことにより熱可塑性ウレタン樹脂フィルム面と不織布を構成する繊維との接触部分が点接着すると目され、そのことにより積層シートは硬化することなく、強固な接着力と適度な風合いと伸縮性とを保有するという事実を知見し、本発明を完成するに至った。

【0006】即ち、本発明は、上記知見に基づき、熱可塑性ウレタン樹脂フィルムとポリオレフィン系繊維からなる不織布との組合せにおいて、該不織布の少なくとも接合面を予めコロナ放電処理を施すことにより強固な接着力と伸縮性・風合いに優れた積層シート及びその製造方法を提供することを目的とするものであり、更に本発明は、前記コロナ放電処理を部分的に施すか、又は該コロナ放電処理の強度を強・弱に変化させて熱可塑性ウレタン樹脂フィルムとポリオレフィン系繊維からなる不織布とを積層・圧着するか、又は該不織布全面もしくは一部分にコロナ放電処理を施し、これを凹凸賦形ロール例えばエンボスロール等の押えロールで部分的に押・圧着して接着力に強・弱をつける等の方法である。即ち、部分的に強固に接着せしめて積層シート全面の接着力を上げると共に、接着面積を減じることで積層シートの風合い、柔軟性を改良した積層シートの製造方法を提供するものである。

stretchability .

[0005]

[Problems to be Solved by the Invention] Then, As for the inventor . In the actual condition an above-mentioned way to consider, While the adhesion strength the retention the diligent investigation was continued it is done concerning the lamination bonding technology of this kind laminated sheet which the texture and the stretchability which are superior the combining is done, Simply without using the adhesive the joint surface of nonwoven fabric side when contact portion amount of the thermoplasticity urethane resin film surface and the fiber which the point bonding does the nonwoven fabric , by administering the corona discharge treatment to be regarded, The laminated sheet , knowledge did the fact that with the especially, completing the the present invention reached the point of it possesses with the firm adhesion strength and the moderate texture and the stretchability without the hardening doing.

[0006] Namely, As for the present invention , In above-mentioned knowledge to be based, In the combination of the thermoplasticity urethane resin film and the nonwoven fabric which consists of the polyolefin fiber , Being something which designates that the firm adhesion strength and the laminated sheet and its production method which are superior in the stretchability · texture are offered at least the joint surface of the said nonwoven fabric by beforehand administering the corona discharge treatment as the objective to be, Furthermore as for the present invention , The aforementioned corona discharge treatment the partially is administered, Or changing the strength of the said corona discharge treatment to strong * weakness, the thermoplasticity urethane resin film and the nonwoven fabric which consists of the polyolefin fiber the lamination · pressure bonding it does, or administers the corona discharge treatment to the said nonwoven fabric entire surface or the one part , this the partially pressing & the pressure bonding does with the holding down roll of the unevenness forming roll for example embossing roll etc and to the adhesion strength strong * weakness such as is acquired is the method . Namely, the adhesion obtaining partially firmly, as it increases the adhesion strength of the laminated sheet entire surface , it is something which offers the production method of the laminated sheet

[0007]

【課題を解決するための手段】上記目的に適合する本発明の特徴は、熱可塑性ウレタン樹脂フィルムと、ポリオレフィン系繊維よりなり前記フィルムとの積層面に対し予めコロナ放電処理を施した不織布を積層圧着してなることにあり、また、本発明は、上記積層シートを製造する方法として、前記熱可塑性ウレタン樹脂をフィルム状に押し出し、該フィルムが未だ熔融状態にある間に、少なくとも片面側の全面又は部分的にコロナ放電処理を施したポリオレフィン系繊維よりなる不織布をその処理面をフィルム側にして押えロールで全面又は部分的に積層・圧着せしめるものである。

【0008】上記熱可塑性ウレタン樹脂としては、ポリエーテル系、ポリエステル系、ポリカーボネート系、ポリラクトンエステル系が適当なポリオール成分であり、ポリオール成分、ポリイソシアネート成分及び必要に応じ鎖延長剤とを反応させることにより生成される。また、該熱可塑性ポリウレタン樹脂をフィルム状に押し出した時の厚みは、5～100 μ mが好ましく、5 μ m未満では破損され易く、また100 μ mを越えるとより厚くなって積層シートの風合い、柔軟性が低下するという傾向がみられる。そして特に最適の厚みは10～40 μ mの比較的薄い方が最適の風合いと柔軟性とを保有する。

【0009】次に、熱可塑性ウレタン樹脂をフィルム状に押し出す押出装置としては、Tダイ、Lダイ等を有する一般の押出機が用いられるが、ダイから出たフィルムに対し直接ニップロールにより不織布と積層・圧着されて貼合される。この時貼合される不織布は押し出したフィルムに対し片面又は両面からのサンドイッチ構造を形成させることもで

which improves the texture, flexibility of the laminated sheet by the fact that it reduces the adhesion area.

[0007]

[Means to Solve the Problems] as for feature of the the present invention which conforms to the above-mentioned objective, thermoplasticity urethane resin film. The lamination pressure bonding doing the nonwoven fabric which beforehand administers the corona discharge treatment consists of the polyolefin fiber and vis-a-vis the lamination plane of theaforementioned film, the times when it becomes to be. In addition, As for the present invention, The method which the above-mentioned laminated sheet the production is done doing. The extrusion it does the aforementioned thermoplasticity urethane resin in the film, the nonwoven fabric which consists of the polyolefin fiber to which the said film still while beingthe molten state, at least administers the entire surface or the partially corona discharge treatment of one surface sideit holds down and the treated surface on film side the entire surface or they are ones which the partially lamination・pressure bonding are done with the roll.

[0008] As the above-mentioned thermoplasticity urethane resin, polyether system, the polyester type and polycarbonate system, the polylactone ester type is the suitable polyol component, according to need the polyol component, the polyisocyanate component and the producing it is done by the reaction it does the chain extender. In addition, when the extrusion doing the said thermoplastic polyurethane resin in the film, when as forthe thickness, the 5 to 100 μ m is desirable, under the 5 μ m the breakage is easyto be done, in addition the 100 μ m exceeds becoming thicker, you cansee the tendency that the texture of the laminated sheet, the flexibility does the decrease. And as for the thickness of the especially optimum the one where the 10 to 40 μ m is thin relatively possesses with the texture and the flexibility of the optimum.

[0009] Next, it can use the general extruder which possesses the T-die and the L die etc the thermoplasticity urethane resin as the extrusion equipment which the extrusion is done in the film, but the nonwoven fabric and the lamination・pressure bonding being done vis-a-vis the film

きる。

【0010】本発明において用いられる不織布は、ポリオレフィン系繊維から構成されるがポリエチレン系、ポリプロピレン系繊維又はポリオレフィン系エラストマー繊維等が好適である。更に、例えばポリオレフィン系を表面層（鞘）とし、芯層としてポリエステル系、その他の樹脂で形成された芯・鞘構造等の複合繊維又はオレフィン系繊維と他の繊維をブレンドした不織布でもよいが、熱可塑性ウレタンフィルムとの積層面は必ずポリオレフィン系繊維を含む繊維で構成することが必要である。これはポリオレフィン系繊維の極性をコロナ放電処理を施すことによって活性化せしめるためである。

【0011】そしてこれら不織布の適当な製法としては、湿式法、乾式法、スパンレース、スパンボンド更にメルトブロー法等の何れでもよいが、最終製品の要求特性上の柔軟性及び風合いの優れたものであるためにはスパンレース、スパンボンドが好適である。

【0012】更に、ウレタン樹脂の弾性を生かすためには、不織布の方もスパンレース、メルトブローの如くシートとして縦方向、横方向の少なくとも一方向に50%伸張時の伸張回復率が70%以上となるものが好ましい。

【0013】次に、本発明において積層シートを製造する方法としては、熱可塑性ウレタン樹脂を先ずフィルム状に押出し、その熔融状態にある間に不織布と積層・圧着するが、この際不織布面の前記ウレタンフィルムとの積層面に予めコロナ放電処理を施すことが必要である。該コロナ放電処理を施す方法としては、絶縁された電極を接地された対極誘電体ロールとの間に不織布を通し、この間に高周波、高電圧を印加し、コロナ放電を生じさせ、このコロナ放電によって不織布表面を改質せしめるのである。この処理に用いられるコロナ放電処理装置としては、IGBT (in

which comes out of the die by the nip roll directly the lamination it is done. This time the nonwoven fabric which the lamination is done can also make the one surface or the sandwich structure from the both surfaces form vis-a-vis the film which the extrusion is done.

[0010] As for the nonwoven fabric which is used in the the present invention. The polyethylene type which is formed from the polyolefin fiber, the polypropylene type fiber or polyolefin elastomer fiber etc is ideal. Furthermore, the surface layer (shell) with it does for example polyolefin system, the multicomponent fiber of the polyester and the core-shell structure etc which was formed with the other resin, or, it is good even with the nonwoven fabric which the olefin fiber and the other fiber the blend is done as the core layer, but. As for the lamination plane of the thermoplasticity urethane film, the thing which is constituted with the fiber which by all means includes the polyolefin fiber is necessary. This is the polarity of the polyolefin fiber by administering the corona discharge treatment because which the activation is done.

[0011] And as the suitable production method of these nonwoven fabric, it is good with whichever of the wet method, the dry method, the spunless and the spun bond furthermore the melt blowing method etc, but in order a flexibility on the required property of the final product and something where the texture is superior to be, the spunless and the spun bond are ideal.

[0012] Furthermore, in order to utilize the elasticity of the urethane resin, as though also the nonwoven fabric is the spunless and the melt blowing, the longitudinal direction and the transverse direction at least those where the drawing recovery ratio at the time of the 50% drawing becomes the 70% or higher in the one direction are desirable as the sheet.

[0013] Next, the extraction it does the thermoplasticity urethane resin first in the film the production is done the laminated sheet as the method which in the the present invention, while being the molten state, the nonwoven fabric and the lamination-pressure bonding it does, but in this case it is necessary beforehand to administer the corona discharge treatment to the lamination plane of the aforementioned urethane film of the nonwoven fabric surface. As the

ulated gate biporan transistor) 方式、スパークギャップ方式、真空管方式及びソリッドステート方式等があるが、この発明においてはこれら方式の何れでもよく、特に限定されない。そして不織布のコロナ放電処理面は、少なくとも熱可塑性ウレタン樹脂フィルムとの積層面を処理するならば片面、両面どちらでもよい。更に不織布へのコロナ放電処理は予め処理を施し一度巻取って後に熱可塑性ウレタン樹脂フィルムと積層・圧着してもよいし、積層・圧着する直前のオンライン上でコロナ放電処理してもよい。コロナ放電処理の強さは特に限定されないが、不織布の風合いを損なわない程度が望ましい。

【0014】また、該コロナ放電処理を部分的に施すか、又はコロナ放電処理の強度を部分的に変化させて強弱を付与し、熱可塑性ウレタンフィルムと積層・圧着することにより積層シート全体としての接着力を損なうことなく、適度の風合い、柔軟性を改良させることができる。ここにおいて、部分的に処理を施すとは、具体的にはコロナ放電電極間の間隔を大きくとるか、または電極への通電のオン・オフを断続的に行う等の方法があり、その例として、コロナ照射面がストライプ状や格子状であってもよく、またランダム様であってもよく、要は接着点が 25mm^2 内に1箇所以上存在し、接着面積は20%以上もしくは接着力が $20\text{g}/\text{インチ巾}$ 以上であることが好ましい。そして、接着点が 25mm^2 内に1箇所未満の場合、また接着面積が20%未満の場合、更に接着力が $20\text{g}/\text{インチ巾}$ 未満の場合には、共に接着力が不足して、目的の積層シートとすることにはすすめられない。また、コロナ放電処理を施した不織布と前記ウレタンフィルムとを積層し、押さえロールにより圧着するに際し、例えばエンボスロールにより部分的に圧着して接着力に強・弱を付与することによっても風合いは改良される。

method which administers the said corona discharge treatment, at this time the high frequency and the high voltage the imprinting are designated as with the counter electrode dielectric roll which the electrode which the insulating is done the ground contact is done through the nonwoven fabric, the corona discharge is made to cause, it is the improvement to do the nonwoven fabric surface with this corona discharge. There is a IGBT (insulated gate biporan transistor) system, a spark gap system, a vacuum tube system and a solid state system etc, as the corona discharge treatment equipment which is used for this process, but regarding this invention it is good with whichever of these systems, especially is not limited. And the lamination plane of the thermoplasticity urethane resin film the process it does the corona discharge treatment surface of the nonwoven fabric, at least, if is, the one surface, it is good both surfaces whichever. Furthermore the corona discharge treatment to the nonwoven fabric it administers the process one time retracts and the thermoplasticity urethane resin film and the lamination pressure bonding is possible to do beforehand and after the lamination pressure bonding immediately before doing, the corona discharge treatment it is possible to do on the online. The strength of the corona discharge treatment especially is not limited, but the extent which does not impair the texture of the nonwoven fabric is desirable.

[0014] In addition, the partially it administers the said corona discharge treatment, or the partially changes the strength of the corona discharge treatment and the provision does strength, the moderate texture, it is possible as the laminated sheet entirely the thermoplasticity urethane film and by the lamination pressure bonding doing without impairing the adhesion strength, to make the flexibility improve. Here putting, The partially process is administered with, The interval between the corona discharge electrode is taken concretely largely, Or the method which does the on/off of the conducting electricity to the electrode intermittently to be, As the example, the corona irradiation surface may be the stripe and the lattice, in addition to seem the random way is possible, as for main point the adhesion point the above the 1 site exists inside the 25mm^2 and as for the and the adhesion area it is desirable for the 20% or higher or the adhesion strength to be above the $20\text{g}/\text{inch width}$. When and, the adhesion point is under the 1 site

and, the adhesion point is under the 1 site inside the 25 mm², in addition when the adhesion area is under the 20%, when furthermore the adhesion strength is under the 20g/ inch width, the adhesion strength becoming insufficient together, it is not recommended to that it makes the laminated sheet of the objective. In addition, the lamination it does the nonwoven fabric and the aforementioned urethane film which administer the corona discharge treatment, the partially pressure bonding doing with the hold down roll the pressure bonding it does at the time of, for example with the embossing roll the texture is improved by the thing which it grants strong * weakness in the adhesion strength.

【0015】

【作用】上記本発明における熱可塑性ウレタン樹脂フィルムに、予め積層面にコロナ放電処理を施したポリオレフィン系繊維からなる不織布を積層・圧着した積層シートは、ポリオレフィン系繊維からなる不織布面へのコロナ放電処理により不織布の表面が活性化されて表面張力が低下し、これが熔融状態である熱可塑性ウレタン樹脂フィルムと圧着されることにより、両者はいわゆる点接着面を形成し、その結果適度な伸縮性と優れた風合いとを保有するものと考えられる。また、前記不織布面へのコロナ放電処理を部分的に施し、あるいはコロナ放電処理に強・弱を付与して施した不織布をフィルムと圧着・積層あるいは押圧時に部分的に押圧したり、圧着力を変化させることにより、さらに積層シートの風合いを改良することができる。そして、この積層シートの製造においては、その接合面には何らの接着剤を使用することがないので工程上簡略化される共に、接着剤あるいは樹脂による不織布面上へのアンカー効果によるシートの硬化現象は起こることなく、優れた風合いと伸張回復性を保有しながら、コロナ放電処理による極性不織布と熔融ウレタンシートとの相互圧着により強固に接着され、相乗効果が発揮される。

[0015]

[Work or Operations of the Invention] In the above-mentioned the present invention to the thermoplasticity urethane resin film, The nonwoven fabric which consists of the polyolefin fiber which beforehand administers the corona discharge treatment to the lamination plane the lamination · pressure bonding is done as for the laminated sheet, The surface of the nonwoven fabric the activation being done by the corona discharge treatment to the nonwoven fabric aspect which consists of the polyolefin fiber the surface tension does the decrease, the both forms the so-called point bonding aspect the thermoplasticity urethane resin film and the pressure bonding where this is the molten state by being done, is thought the thing which possesses the result moderate stretchability and the texture which is superior. In addition, furthermore it is possible by the partially administering the corona discharge treatment to the aforementioned nonwoven fabric surface, or the provision does strong * weakness in the corona discharge treatment and the film and the partially pressure it does the nonwoven fabric which is administered the pressure bonding · lamination or the pressure at the time, changes pressure bonding power, to improve the texture of the laminated sheet. And, Regarding the production of this laminated sheet, Because there is not a thing which the adhesive is used in the joint surface, the simplification on the step it is done together, The hardening phenomena of the sheet due to the anchoring effect to on the nonwoven fabric surface due to the adhesive or the resin while possessing the texture and the drawing recoverability which are superior without happening, the adhesion makes firm by the mutual pressure bonding of the

【0016】

【実施例】以下、更に本発明を具体的に実施例に基づき詳細に説明する。

【0017】（実施例1）熱可塑性ウレタン樹脂（商品名「エラストラン1180A」武田バーディシェ社製）をTダイ押出機を用いて厚み30 μ mのフィルム状に押し出し溶融状態下の片面と、その貼合せる面に予め放電量400W/m²・分でコロナ放電（IGBT方式）処理した目付量30g/m²のポリプロピレン（PP）繊維のспанレースの不織布とをニップロールによって積層・圧着して貼合せた。上記製法により得られた積層シートの接着力、50%伸張時の伸張回復率及び風合い等の各物性を測定し、その結果を表1に示した。

【0018】なお、物性値の測定方法は、接着力はJISK 6256に準拠して行い、50%伸張時の伸張回復率は、幅2.5cm、長さ14cmの試験片を用いてその掴み間隔10cm、引張り速度50mm/分で引張試験機を用いて5cm伸張させ、1分間放置後50mm/分で弛緩せしめて応力が0になる時点での残留伸び（a mm）を測定して下記式により求めた。

【0019】

【数1】

$$\text{伸張回復率 (\%)} = [1 - (a/50)] \times 100$$

【0020】また、風合い試験は手による触感により◎は最良、○は良好、×は不良の3段階として表示した。

【0021】（実施例2）熱可塑性ウレタン樹脂（商品名「ミラクトランP-885」日本ミラクトラン社製）を用

polarity nonwoven fabric and the melt urethane sheet due to the corona discharge treatment, the synergistic effect is shown.

【0016】

[Working Example(s)] The below, furthermore the the present invention concretely is explained in detail on the basis of the Working Example.

[0017] (Working Example 1) The extrusion it does the thermoplasticity urethane resin (tradename "Elastran 1180A" Takeda Badische corporation make) in the film of the thickness 30 μ m making use of the T-die extruder and the one surface under the molten state and the lamination the nonwoven fabric of the spunless of the polypropylene (PP) fiber of the apparent weight 30g/m² which the corona discharge (IGBT system) process is made the surface beforehand at discharge quantitative 400W/m² · amount the lamination · pressure bonding it does with the nip roll and the lamination does. The adhesion strength of the laminated sheet which is obtained by the above-mentioned production method, each property of the drawing recovery ratio and the texture etc at the time of the 50% drawing the measurement was done, the result was shown in the Table 1.

[0018] Furthermore, As for measurement method of property value, As for the adhesion strength the standard doing in the JIS K 6256, to do, The clamp interval 10cm, the 5cm drawing making use of the tensile tester, after 1 minute leaving with the 50 mm/min the relaxed obtaining, the measurement doing the residual elongation (a mm) with the time point where the stress becomes the 0 with the stretching speed 50 mm/min, making use of the test piece of the width 2.5 cm and the length 14cm it sought the drawing recovery ratio at the time of the 50% drawing, with the below Formula.

【0019】

[Mathematical Formula 1]

$$\text{Drawing recovery ratio (\%)} = [1 - (a/50)] \times 100$$

[0020] In addition, as for the texture test depending * the optimum, the satisfactory and the X the display it did 0 in the feel by the hand as the 3 step of the poor.

[0021] (Working Example 2) The thermoplasticity urethane resin (tradename "Mylactran P-885"

い、実施例1と同様にTダイ押出機を用いて厚み $20\mu\text{m}$ のフィルム状に押出し、熔融状態の間にこのフィルム片面と、その積層貼合せる面に予め放電量 $500\text{W}/\text{m}^2 \cdot \text{分}$ でコロナ放電(IGBT方式)処理した目付量 $40\text{g}/\text{m}^2$ のポリエチレン(PE)を鞘材とし、ポリエステル(PET)を芯材とした芯鞘構造のспанレースの不織布をニップロールによって積層・圧着して貼合せた。上記製法により得られた積層シートは、実施例1と同様に物性評価を行い、その結果は表1に示した。

【0022】(実施例3) 実施例1で用いたと同様の熱可塑性ウレタン樹脂を厚み $30\mu\text{m}$ のフィルム状に押出し、その両面とそれぞれ積層貼合せる面に予め放電量 $300\text{W}/\text{m}^2 \cdot \text{分}$ でコロナ放電(IGBT方式)処理した目付量 $30\text{g}/\text{m}^2$ のポリプロピレン(PP)繊維よりなるспанレースの不織布をニップロールによって前記フィルムの両面に積層・圧着して貼合せた。上記により得られた3層構造の積層シートは実施例1と同様に物性評価を行い、その結果は表1に示した。

【0023】(実施例4) 実施例1で用いたと同様の熱可塑性ウレタン樹脂を厚み $30\mu\text{m}$ のフィルム状に押出し、熔融状態下の片面と、その貼合せる面に予め放電量 $400\text{W}/\text{m}^2 \cdot \text{分}$ で幅 5mm 、間隔 5mm ごとに流れ方向のストライプ状にコロナ放電(IGBT方式)処理を施した目付量 $30\text{g}/\text{m}^2$ のPP繊維のспанレースの不織布とをニップロールによって積層・圧着して貼合わせ、同様に物性評価を行い、その結果は表1に示した。

【0024】(実施例5) 実施例2で用いたと同様の熱可塑性ウレタン樹脂を厚み $30\mu\text{m}$ のフィルム状に押出し、

Japan Milactoran corporation make) to use. In the same way as the Working Example 1 making use of the T-die extruder in the film of the thickness $20\mu\text{m}$ the extrusion to do. The lamination pressure bonding doing the nonwoven fabric of the spunless of the core-sheath structure which this film one surface and the lamination designates the polyethylene (PE) of the apparent weight $40\text{g}/\text{m}^2$ which the corona discharge (IGBT system) process is made the surface beforehand at discharge quantitative $500\text{W}/\text{m}^2 \cdot \text{min}$ as the sheath material between the molten state. designates the polyester (PET) as the core material with the nip roll. the lamination it is. The laminated sheet which is obtained by the above-mentioned production method did the property Evaluation in the same way as the Working Example 1. showed the result in the Table 1.

[0022] (Working Example 3) That it used with the Working Example 1, the extrusion it does the similar thermoplasticity urethane resin in the film of the thickness $30\mu\text{m}$, the both surfaces and the respective lamination the lamination pressure bonding it does the nonwoven fabric of the spunless which consists of the polypropylene (PP) fiber of the apparent weight $30\text{g}/\text{m}^2$ which the corona discharge (IGBT system) process is made the surface beforehand at discharge quantitative $300\text{W}/\text{m}^2 \cdot \text{min}$ in the both surfaces of the aforementioned film with the nip roll and the lamination does. The laminated sheet of the 3-layer structure which is obtained by description above did the property Evaluation in the same way as the Working Example 1, showed the result in the Table 1.

[0023] (Working Example 4) That it used with the Working Example 1, the similar thermoplasticity urethane resin in the film of the thickness $30\mu\text{m}$ the extrusion to do. The one surface and the lamination under the molten state the lamination pressure bonding doing the nonwoven fabric of the spunless of the PP fiber of the apparent weight $30\text{g}/\text{m}^2$ which on the surface beforehand at discharge quantitative $400\text{W}/\text{m}^2 \cdot \text{min}$ administers the corona discharge (IGBT system) process to the stripe of the machine direction in every width 5mm and the interval 5mm with the nip roll. the lamination, it did the property Evaluation in the same way, showed the result in the Table 1.

[0024] (Working Example 5) That it used with the Working Example 2, the similar thermoplasticity

熔融状態の間にこのフィルム片面側と、その積層貼合わせ面に予め放電量 $500\text{W}/\text{m}^2 \cdot \text{分}$ でコロナ放電(IGBT方式)処理を施した目付量 $40\text{g}/\text{m}^2$ のPEを鞘材とし、PETを芯材とした芯・鞘構造のспанレースの不織布とを、押さえロールとして一辺5mm角の正方形が中心間10mm間隔で凸状態となっているエンボスロールで圧着して貼合わせ、同様に物性評価を行い、その結果は表1に示した。

[0025] (比較例1) 実施例1において、不織布にコロナ放電未処理の場合以外はすべて実施例1と同様に行い、その結果は表1に示した。

[0026] (比較例2) 比較例1において、熱可塑性樹脂フィルムの厚みを $70\mu\text{m}$ とした以外はすべて比較例1と同様に行い、その結果は表1に示した。この場合はフィルムが不織布にめり込むアンカー効果による接着のため接着力は強いが、伸張回復性が劣り風合いも悪かった。

[0027]

[表1]

	実施例 1	実施例 2	実施例 3	実施例 4	実施例 5	比較例 1	比較例 2
不織布種	PP	PE/PET (鞘/芯)	PP・PP	PP	PE/PET (鞘/芯)	PP	PP
フィルム厚み (μm)	30	20	30	30	20	30	70
積層シート構成	2層	2層	3層	2層	2層	2層	2層
コロナ放電量 ($\text{W}/\text{m}^2 \cdot \text{分}$)	400	500	300	400	500	未処理	未処理
処理面	全面	全面	全面	部分	全面	全面	全面
圧着面	全面	全面	全面	全面	部分	全面	全面
接 力 (インチ幅)	430	580	200	310	350	<10	(注2) >1000
50%伸張時の伸 張回復率(%)	92	88	84	95	90	(注1) ※	65
風合い	○	○	○	◎	◎	○	×

注1) ※は50%伸張時にフィルムと不織布の剥離発生

注2) 材料破壊発生

urethane resin in the film of the thickness $30\mu\text{m}$ the extrusion to do. Between molten state this film one surface side, on the lamination the PE of the apparent weight $40\text{g}/\text{m}^2$ which beforehand administers the corona discharge (IGBT system) process to the surface at discharge quantitative $500\text{W}/\text{m}^2 \cdot \text{min}$ the sheath material to do. The square in one edge 5mm angle being the 10mm gap between the center as the hold down roll with the nonwoven fabric of the spunless of the core・shell structure which designates the PET as the core material, the pressure bonding doing with the embossing roll which becomes the convex condition, the lamination, it did the property Evaluation in the same way, showed the result in the Table 1.

[0025] (Comparative Example 1) In the Working Example 1, in the nonwoven fabric in case of the corona discharge untreated it did other than in the same way as all Working Example 1, showed the result in the Table 1.

[0026] (Comparative Example 2) In the Comparative Example 1, other than designating the thickness of the thermoplastic resin film as the $70\mu\text{m}$, it did in the same way as all Comparative Example 1, showed the result in the Table 1. In this case because of the adhesion due to the anchoring effect where the film sinks to the nonwoven fabric the adhesion strength is strong, but the drawing recoverability the deterioration texture was bad.

[0027]

[Table 1]

【0028】表1に示す如く、本発明の実施例1～5の積層シートは何れも接着力、50%伸張時の伸張回復率及び風合い共に良好である。

【0029】これに対し、熱可塑性樹脂フィルムと積層する不織布の積層面に対しコロナ放電処理を施さない比較例1、2においては接着力、50%伸張時の伸張回復率及び風合いの点においてその併立は困難であり、本発明におけるコロナ放電処理の作用が十分認められた。

【0030】

【発明の効果】本発明の積層シートによれば、強固な接着力、伸張回復率及び風合いの三特性面のバランスは良好であり、特にこの種積層シートの用途としての柔軟性、風合い等の要求特性に対し優れた効果を発揮する。また、その製造工程は接着剤を使用しないので簡単で、しかもウレタンフィルム固有の伸縮性及び不織布の風合いを損なうことなく強固に接着された積層シートが得られる。

フロントページの続き

(72)発明者 八木 晃

兵庫県加古郡稲美町六分一字内ヶ池1176

東洋ゴム工業株式会社兵庫事業所内

[0028] As though it shows in the Table 1, the laminated sheet of the Working Example 1 to 5 of the the present invention in each case both the drawing recovery ratio and the texture at the time of the adhesion strength and the 50% drawing is the satisfactory.

[0029] Regarding the Comparative Example 1,2 which does not administer the corona discharge treatment vis-a-vis this, the thermoplastic resin film and vis-a-vis the lamination plane of the nonwoven fabric which the lamination is done the both stand was difficult in the drawing recovery ratio at the time of the adhesion strength and the 50% drawing and the point of the texture, it could recognize the action of the corona discharge treatment in the the present invention sufficiently.

[0030]

[Effects of the Invention] According to the laminated sheet of the the present invention, the firm adhesion strength, the balance of three characteristic aspects of the drawing recovery ratio and the texture is the satisfactory, as the application of the especially this kind laminated sheet etc the effect which is superior vis-a-vis the required property of the flexibility and the texture is shown. In addition, because as for the production step which the adhesive is not used being simple, you can obtain the laminated sheet which the adhesion makes firm furthermore without impairing the texture of the urethane film intrinsic stretchability and the nonwoven fabric.

Continuation of front page

(72) Inventor Yagi Akira

Hyogo Prefecture Kako-gun Inami-cho
Rokubuichi Aza Uchinoike 1176

The inside of Toyo Tire & Rubber Co.,
Ltd. Hyogo business place

Willow Lake Technical Forum

Forum: Patents
Topic: Nonwovens

Derwent Class: A81; D22; G03; A18; A96;
Int Pat Class: C09J-125/02; C09J-153/02

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011104364 WPI Acc No: 97-082289/08
XRAM Acc No: C97-026469
XRPX Acc No: N97-068152

Laminated sheet for diapers - comprises laminated nonwoven polyolefin
fibres and thermoplastic urethane resin film
Patent Assignee: (TOYF) TOYO RUBBER IND CO LTD
Number of Patents: 001
Number of Countries: 001
Patent Family:

CC Number	Kind	Date	Week	
JP 8323930	A	961210	9708	(Basic)

Priority Data (CC No Date): JP 95100706 (950331)
Applications (CC,No,Date): JP 95203800 (950717)
Abstract (Basic): JP 08323930 A

A laminated sheet is obtd. by (1) laminating (A) nonwoven fabric
composed of polyolefin fibres and (B) thermoplastic urethane resin film
with the corona-treated face of the fabric (A) facing the film (B) and
(2) pressing the obtd. laminate.

USE - As sports clothes or diapers.

Dwg.0/0

Derwent Class: A94; D22; F07; P73;
Int Pat Class: B32B-027/12; B32B-027/40; B32B-031/20; B32B-031/30;
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011103423 WPI Acc No: 97-081348/08
XRPX Acc No: N97-067424 *Image available*

Mat and diaper for excrement processing used by e.g. seriously ill
patient and bedridden elderly person - has recess which engages to
crotch of user e.g. patient when its lower back body is laid on mat